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CAMPLIN, John M.

ON
DIABETES,



AND
ITS SUCCESSFUL TREATMENT.

BY
JOHN M. CAMPLIN, M.D., F.L.S.

LONDON:
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The limited circulation of the 'Transactions of the Royal Medical and Chirurgical Society,' has induced me to republish the following paper, which I have thought it best to do in the form in which it originally appeared.

I have appended to it, a short sketch of the opinions of some who are now attempting an elucidation of the phenomena of diabetes, together with my own observations on its nature and treatment, and the results of my subsequent experience.

J. M. C.

33, COMPTON TERRACE, ISLINGTON,
and 11, FINSBURY SQUARE;
June, 1858.



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(From Volume XXXVIII of the 'Medico-Chirurgical Transactions,' published by the Royal Medical and Chirurgical Society of London.)

ON THE
JUVANTIA AND LÆDENTIA
IN
DIABETES.

BY
JOHN M. CAMPLIN, M.D., F.L.S.

COMMUNICATED BY
RICHARD BRIGHT, M.D., F.R.S.

Received Nov 10th, 1854.—Read Jan. 9th, 1855.

SEVERAL eminent professional friends having done me the honour, from time to time, to make inquiries of me on points connected with the complaint under which I formerly laboured, I am induced to relate my case, in the hope that it may afford some hints which may be useful to the profession at large.

In November, 1844, I was prostrated by an attack of diabetes. The symptoms were well marked, and need not be detailed; the professional friends consulted did not expect that I should rally; and one of them went so far as

to say, when asked to 'prescribe for me a particular remedy, that it would only be "smoothing my passage to the grave," and yet here I am, with urine varying from 1·016 to 1·020, instead of 1·040 and upwards, and although ten years older, seldom or never flinching from any professional duty.

There being no doubt as to the nature of my complaint, an altered diet was immediately advised, and a run to the Isle of Wight; the latter I could take for a few days only, and that in the commencement of a cold, dreary winter, yet it assisted materially in arresting my downhill course, and time was gained for the effect of remedies and diet.

All my advisers (and I had several, whose kindness can never be repaid) recommended meat, fish, and eggs, with the *crueiferæ*; they differed, however, in minor points; one advised coffee, another tea; one wine, another brandy, &c. As a substitute for bread, cakes or biscuits made of washed flour and lard were at first recommended; these soon quite disagreed. The gluten bread was next tried; this latter, unpleasant as it was, I took as long as it could be borne; but after a year or two, it became

insupportable, and when passing a few days at Brighton, I availed myself of the advantages of change of air, and Sussex bread, to cast it aside, and have never resumed it. On returning to town, I did pretty well for a time, eating the ordinary bread very sparingly, but afterwards I relapsed, and was almost in despair. Having before this seen Dr. Prout occasionally, and now telling him of my dilemma, he suggested a kind of bran cake, which was immediately prepared according to his directions: it was by no means a pleasant composition, but that was not the worst, for the bran acted powerfully on the bowels, and it could not be continued in that form. We have all heard that "necessity is the mother of invention," and I immediately set a mill-maker to work to make me a mill which should grind the bran into a very fine powder; this means, and careful sifting, overcame the difficulty, and enabled me to succeed in the preparation of a kind of cake which was continued for some years, and with the best effects.¹

I had before this been more rigid in my diet

¹ See Appendix.

than directed by the doctor, who, to use his own expression, "tolerated things which he did not advise." My protracted sufferings, however, now determined me to put away everything saccharine or amylaceous to the utmost possible extent, and I therefore gave up wine, at the same time that the bran cake enabled me to discontinue entirely the use of bread. I now soon became decidedly convalescent, and have never had my diabetic symptoms return with violence. The cold of November still produces unpleasant feelings, and some anxiety, but has not for two or three years rendered necessary even a partial return to the bran cake; and for six or seven winters past, I have not required the double clothing, and the hot bottle in the carriage, which were sometimes indispensable. There can be no question as to this bran cake having greatly prolonged my life, as I was fast becoming a decrepid valetudinarian before its use, and should, in all probability, have altogether broken down long since; and I am the more anxious to dwell on this part of my history, from the conviction that if the bran cake, or some modification of it, were made on a larger scale, it might be used in our hospitals, and

patients might be supplied with it after their discharge, thus obviating one of the difficulties as to their diet, after temporary recovery.¹

At the present time I feel well, so far as the diabetes is concerned,² yet am of opinion that it would be no difficult matter to bring on a return; and believe that there are few who recover so perfectly as to be able to use the indiscriminate diet of former days. I am indeed acquainted with some who go so far as to take potatoes, and even sugar and fruit; but they do this very sparingly, whilst others have fallen speedy victims to imprudence in this respect;

¹ I am quite aware that the use of bran is not a new idea; on the contrary, one of my earliest medical advisers mentioned it, but he had such an opinion of its unmanageableness as entirely discouraged me at the time from making a trial, and by his advice I took the gluten bread; my preparation has the advantages of being by no means disagreeable, does not disorder the bowels, and contains very little starch; some of the bran powder (not prepared for analysis), was put into the hands of Dr. Mareet, a short time since, who found it to contain only 2·52 per cent.

² Dr. Babington examined a specimen of my urine a short time since, the sp. gr. was 1·018, and he found no trace of sugar.

and I would never recommend any one to make the experiment without great caution.¹ In my own person, the specific gravity has increased from 1·025 to 1·037, from taking a glass or two of fruity port wine, without any other assignable cause; and rice puddings, persisted in for a short time, would formerly produce the same effect. I say formerly, with regard to rice, for during the late epidemic, I suffered rather severely from choleraic diarrhœa, and scarcely know what would have been my fate, if restricted to my old diet of meat, greens, and bran cake: as it was, rice and macaroni many days together, (without any fresh vegetables,) produced no alteration of urine, though a sweet taste after meals sometimes reminded me of former days.

To return to the early history of my case.

Fat meat and eggs were more especially directed for me, and were taken without any immediate ill effects, but I am of opinion that they produced great biliary derangement, more especially the eggs, the free use of which has been laid aside long since.

¹ No experiment on diet should be made in the winter, particularly if the north-east wind prevail.

Fish is a most important article of diet for the diabetic, but does not require particular notice, as its use only requires the ordinary cautions for those in moderate health.

I have never found it necessary to disallow the use of milk; the sugar contained in it certainly does not pass into glucose readily, or under ordinary circumstances; and this induces me to notice, that, as to farinaceous substances, their disposition to pass into sugar is not to be estimated simply by their proportions of gluten and starch, and it does not seem to me that anything but experiment will determine the degree in which they do this. Some kinds of bread injure more than others; and in my own person brown bread has often produced greater sweetness in the saliva than that made of fine flour; and it is my opinion that unfermented flour in the various forms in which we use it is less liable to pass into sugar than bread. I have not, however, had opportunity to test this on a sufficiently large scale to be certain of the fact. *Genoa macaroni* I believe to be one of the best substitutes for the bran cake; the finest *macaroni* not only contains more gluten than ordinary bread, but the long boiling

in water which it ought to undergo before being prepared for the table, further diminishes the proportion of starch.

With regard to vegetables, I have almost confined myself to the cruciferæ, as they can be obtained in London during the greater part of the year; the young cabbage, is, perhaps, at once the cheapest and best for ordinary use. Cauliflowers, broccoli, Brussels sprouts, &c., give considerable variety. Seakail is excellent, but rather too expensive; the late Dr. Pereira recommended sour krout to me; but having fresh vegetables at hand I have never tried it. Since my recovery, I have taken French and scarlet beans, without injury; but should consider the cruciferæ highly preferable for the actually diabetie. Spinach is generally considered allowable, and indeed recommended; and those who reside in the country might add to the list other plants of the same natural order, such as the *Chenopodium bonus Henricus*, and the younger leaves of the common beet, both of which I have tasted, and found them very agreeable. My friend, Mr. Ward, in conversation with him on the subject, suggested that the leaves of the *Beta Cicta* and

English spinach - both of these
have been at present - I have
not in my possession

Maritima may be used as pot-herbs; and perhaps the list might be still further enlarged.¹

As to tea or coffee, I have no hesitation in giving the opinion that, in a majority of cases, tea is to be preferred. Milk may be taken with it freely; cream sparingly.

As a beverage at meals, water or toast-water may be used, and, instead of wine or malt liquor, a small quantity of brandy and water, not above a table-spoonful of the former. Wine is better excluded, except claret, which is too expensive for common use. There are several other wines which may be allowable as being free from sugar, but of them I have no experience. The pale French brandy is, no doubt, the best; but I have tried the English eau de vie made in imitation of it, and found it to answer very well, and Dr. Bence Jones informs me that he has sometimes directed

¹ Another of the cruciferae, the watercress, will help to make the breakfast agreeable, and I see no objection to other vegetable products, such as celery, endive, mushrooms, &c., when in season, if the stomach will bear them, provided we avoid starch, sugar, and the vegetable acids.

rum, which, being without sugar, is, *quoad hoc*, as eligible as brandy. Sponging with tepid water, followed by friction, has been so beneficial, in more than one case in which I have been consulted, as to call forth the highest encomiums. For myself, I have only practised sponging with cold salt and water in the summer, and an occasional warm bath in the winter: these I have used with great advantage.¹

Warm clothing—a leather waistcoat, and gutta percha soles to the boots, in winter, are very important. It would be superfluous to descant on the advantages of change of air and occupation; but I may mention that, whilst at home, I constantly used the bran cake; if I left town for a time, and took the prepared bran with me, I seldom used it beyond two or three days, and never felt the worse for taking the liberty of substituting bread under the influence of change of air and scene. When I returned home I continued the bread, until

¹ I think it is important that the bathing should be followed by friction, and, if plain water is used, hair gloves should be employed, or some similar means of encouraging a sustained action on the skin.

warned by a partial recurrence of symptoms to have recourse to my bran cake. This took place several times before I was able altogether to discontinue its use.

It is not my intention, in the present paper, to go into details as to the *medical* treatment of diabetes. Nevertheless, I am unwilling to conclude without making some allusion to it, or entirely to omit noticing the effects of medicine on myself.

In the first place, I know of no specific remedy for the disease; and notwithstanding the successful issue of my own case, and that I have witnessed other cases which have recovered and stood their ground several years, I fear that there are many which will prove fatal, in spite of any means to which we can have recourse. Where the disease attacks the thin and delicate, with a disposition to tubercular or some other form of disease, in which the constitution breaks down, although change of air and appropriate remedies may check the disease, and sometimes enable us to overcome it, we shall often fail. In fact, we must expect this to be the case where we cannot remove the causes, whether original, or the result of the

circumstances in which the individual is placed. On the other hand, where the complaint is simply a form of mal-assimilation, without serious organic mischief, and the case is one in which we can diminish or control the exciting causes, and the patient will submit to regimen, we may fairly hope for the best results. As a type of the latter, I may mention the case of a clergyman, who consulted me a few months since, a large, stout man, who had taken a free, mixed diet, and been, according to his own statement, "a great bread-eater." His urine was upwards of 1·040, and the quantity considerable, and he is not sound on other points, besides being diabetic; yet he has no lung affection, and I believe the action of the kidneys to be merely eliminative, and that he may be restored to good general health, by treating his case as you would a modified form of dyspepsia, viz., denying those articles of diet which promote the disordered action, and at the same time invigorating the stomach and nervous system; and, in fact, two letters I have received from him detail his progressive improvement. As a case of the former class, that of a thin, delicate, young lady, highly nervous and

excitable, whose sister had died of a similar disease, and who had lately suffered from intense mental anxiety, may be referred to. She had consulted one of our most eminent physicians some time before I saw her, who had enjoined a meat diet, ammonia, &c., which had been most strictly adhered to. In spite of these, the disease continued to gain ground, and when I became her regular attendant, two or three weeks before death, the whole system was in a state of the highest excitement, the pulse above 120, there was great emaciation, intense thirst, and almost constant sickness. The symptoms were, in a degree, tranquillised by effervescents and opiates; but as the stomach never regained its power to take nourishment, although she was allowed almost a *carte blanche* as to aliments, she sank rapidly. In this case, no remedy could have availed much. There was the constitutional disposition, and a source of anxiety and mental suffering which could not be removed.¹ It is scarcely necessary to

¹ In this case, the urine which had been a long time in very large quantity, and containing only sugar as an abnormal ingredient, became albuminous towards the last, and increasingly so as the fatal termination ap-

observe, that there are many cases not of so decided a character as either of the above, and in which the circumstances of constitution, occupation, &c., are so variously modified and combined, that each becomes more or less a separate study.

Instead of there being a specific for this disease, the cases of recovery which I have witnessed have occurred under the use of various remedies, and the same case has been greatly benefited by a change from time to time, keeping in view the great principles of building up the system, promoting the action of the skin, regulating the action of the liver, &c., and searching into, and, as much as possible, removing the causes of the disease.

If I were to speak of one medicine more than others, it would be the citrate of ammonia in the effervescent form, generally combined

proached. A specimen examined a few days before death contained sugar, albumen, torulæ, and a few casts, and the sp. gr. had fallen so low that, if I recollect right, the last examined was only 1.014, and was as albuminous as in ordinary cases of albuminuria; the kidneys were found large, flabby, and congested, but with no decided marks of disease or degeneration.

with the citrate of iron. Bitters and alkalies did me great service at one period of my attack. Opiates are useful in some cases, where the quantity of urine passed is very great, to give a temporary check; beyond that, I think them objectionable. Cod-liver oil has been used in some of the cases with whose history I have been acquainted, but without any very satisfactory results. I am of opinion, however, that there are cases in which its use is indicated; and purpose, when I have one that seems suited, to give it a further trial, probably in conjunction with Vin. Ferri or Infus. Quassiae.

I have already mentioned ammonia in the form of citrate. As to the sesquicarbonate, I cannot speak favorably of its effects in my own case. A kind medical friend, who saw me often in an early stage, recommended a steady perseverance in its use, and I continued it, in gradually increased doses, a considerable time, but without any decided advantage. When, at length, the stomach could no longer bear it, he advised ammonia in the form of benzoate. This was too much for me, being perfectly nauseous, and, after a few doses, I discontinued ammonia, except, in combination with Infus. Cascarillae

or camphor mixture, as an occasional remedy. In this way I found it very useful, and for some years carried about with me a small draught, of which I took an occasional sip. This and all other medicines I have left off long since, unless it can be considered as medicine, that I sometimes chew a little broken cascarilla bark, or quassia, when kept beyond the usual time for meals, or in any way the worse for wear.

So much, then, for the facts of my case, and the observations I have been able to make on those of others, and it is not my purpose to go beyond this. If disposed to enter into discussion on the disease itself, I should class it amongst the neuroses, believing that exhaustion of nervous power, or some deranged state of nervous system, exists in all cases; yet I cannot but think that diet is also concerned in many. Still less am I disposed to undervalue the effects of regimen, and the other non-naturals, as they used to be termed, in its treatment.

In my own case, two causes had long been at work: the wear and tear of a laborious profession, and a diet in which fruits, rice, &c., had too large a share: and the disease, which

had no doubt been creeping on unobserved for some time, was brought to its aeme by eating freely of apples, which the unnatural thirst rendered peculiarly grateful, and at the same time undergoing unusual fatigue, and this too in the month of November. During one night passed in watching a somewhat anxious case, the urine became very great in quantity, as well as abnormal in appearance, and the nature of the complaint was too obvious. My pallid cheeks and sunken countenance, then and for a long time afterwards, will not soon be forgotten by myself or my friends.

Although, previously to the observations of Dr. Prout, the kidneys had been too much considered in this disease, and remedies accordingly directed to restrain their excessive action, without sufficient reference to other symptoms, I think that we must not consider them wholly faultless, particularly when the disease has lasted some time. Indeed, a chain of morbid actions is set up in the various organs:—the bladder is irritated by unhealthy urine; an emptied bladder excites the kidneys to increased action; thirst is encouraged, the

digestion is further impaired, and all the symptoms are aggravated by each other.

I must, however, check myself in these remarks, as not wishing to enter into the discussion of questions which may admit of any difference of opinion, but simply to relate the facts of my own case, and the results of actual experience.

June 25th, 1855.—Some time has now elapsed since my narrative was drawn up, during which I have again experienced the salutary effects of the bran cake. I went on well, notwithstanding a pretty free use of food containing starch, until November last, when the cold winds set in, and my old symptoms gradually returned. When they had attained considerable severity, they were partially checked by additional warm clothing, and restriction to a very small quantity of brown bread; at length this failed, and on the 5th of March, the specific gravity of the morning urine being 1·041, that of the afternoon 1·035, the quantity very considerable, with dry mouth, and tenderness in the back, particularly over the right kidney, it began to be time to take

some decisive step; and I resumed the bran cake. The effect was immediate. On the 8th, the morning urine was scarcely 1·020, the afternoon 1·015, the quantity normal; and although taking no bread, and less meat, I was already beginning to regain flesh;¹ that the change was owing to the substitution of the cake for the brown bread was sufficiently obvious, as the weather continued cold, with a prevalence of north-east winds, and I had still considerable remains of catarrh.

Since the weather has become mild, I have been able to resume amylaceous food partially, and without injury; and, in fact, consider myself well.² The cessation of the diabetic symptoms was followed by congestion in the head, which harassed me several days, but gradually subsided under the use of citrate of

¹ I have often remarked the rapidity with which this has taken place; it has been much more striking than its opposite.

² In addition to my own observation (with both the potash and copper tests), I may mention that my friend Dr. Bence Jones kindly examined a specimen the other day (June 19th), the sp. gr. was 1·020 and he found no trace of sugar.

ammonia, and small doses of Vin. Colehiei ; the uneasiness in the back left me at once, as well as several sensations difficult to be described. I have not yet ventured to return to the use of bread, but continue the bran cake at breakfast and supper ; at dinner, two or three times a week, after meat, or fish, and greens, I allow myself puddings of flour or macaroni ; and at tea, small cakes made with flour, &c.¹

Thus, in brief, I have given the sequel of my history to the present time. I believe that the relapse would not have occurred in a more genial season ; the use of the cake in checking the symptoms until the weather has become more favorable has been most important and striking.

¹ I prefer these cakes to any form of biseuit, having found them to agree much better ; they are prepared as follows :

Rub $1\frac{1}{2}$ or 2 oz. of butter into half a pound of flour, add a teaspoonful of powdered ginger, mix with milk and the *white* of one egg (the white answers every purpose), roll out into a very thin paste, and cut them into round cakes with the top of the flower dredge ; bake quickly, but not too much, about ten minutes will suffice.

ON
DIABETES, &c.

June, 1858.

My personal history has formed a large portion of the foregoing paper, and I wish to continue it, by stating, that since its publication my health has continued good, with but two interruptions, each marking the susceptibility still existing, and the immediate success of my old remedy.

The first was the result of over-fatigue, combined with the difference of diet, during a very short visit to Belgium—these produced a partial return of diabetic symptoms, accompanied by a most peculiar and distressing train of sensations, dependent on the exhausted state of the nervous system, which, as they have no immediate relation to the subject of this paper, I forbear any attempt to describe. Strict diet and tonics gradually restored me, without much interruption to professional duties.

The second occurred in the autumn of last year, when I left London for a few days' relaxation at the sea-side. Accidental expo-

sure to the east wind and damp produced severe fever and rheumatism, which first confined me to bed, and then sent me home very much broken down. After some time these complaints were subdued; but great debility remained, and I perceived a return of old symptoms, in the frequency of micturition, and, on examining the specific gravity of the urine, found it 1.036.

For a long time previously I had taken bread regularly, and other farinaceous matters occasionally; but, with this state of things, determined to return to the bran cake.

On September 24th, my urine, according to my friend Dr. Garrod's glucometer,¹ contained 17 grs. of sugar to the ounce.

¹ This ingenious instrument promises to be very valuable, by enabling us to ascertain the *exact* amount of sugar in the urine in a few minutes. The principle upon which it is constructed is, that glucose when boiled with *carbonate* of potass gives rise to an amber colour—the depth of the tint depending on the amount of sugar present.

The apparatus consists of a standard, a graduated tube of the same calibre as the standard, and an accurately divided minim measure. The standard contains a solution having the exact tint produced by half a grain

September 28th, (only four days after the alteration of diet), it was found to contain less than half a grain, indeed only a trace.

For a short time I followed my plan rigidly, restricting myself to meat or fish, greens, and the bran cake—the result was a very speedy return of health and activity; since then my diet has been that of convalescents.

The cases of diabetes which have fallen under my observation, since the publication of my paper, have been chiefly those of persons past the meridian of life, and have very much resembled my own, as to the success of the treatment.

In those whom I have *personally* attended, the improvement has been most satisfactory, and the attendance comparatively short.

In other cases, in which my opinion has been asked, by medical men, or patients at a distance, I am not in possession of sufficient details to speak with accuracy as to permanent results, but the short reports which have reached me have all been favorable. One case has disappointed me, that of a young lady, who of diabetic sugar to the fluid ounce. (Manufactured by Coxeter.)

could not be prevailed upon to try the bran cake; nor, indeed, to submit to any appropriate regimen.¹

I have also heard of a case (and do not doubt that there have been others), in which attempts were made to manufacture the bran cake, but the result was unsatisfactory, either from not having a sufficiently fine mill, or some fault in the manipulation. I was not consulted in this case, which ended fatally some time since.

Before commencing any account of the opinions of pathologists as to the origin of diabetes in the system, or entering into the theories which have been formed of its essential nature, I would notice to any non-professional reader into whose hands these remarks may fall, that notwithstanding the difference of opinion which exists on these matters, there are, certain, fixed, broad principles upon which the disease is to

As this lady had an unfortunate aversion to any kind of brown bread, had I seen her again I should probably have advised her to try Bouchardat's gluten bread, which, although it contains about 25 per cent. of starch, and is not so pleasant for continued use as the bran cakes, would have been a great improvement on ordinary bread.

be treated; and that, although continued researches into its nature will enable us to classify cases, and in other respects be of great value, we can, even now, lay down maxims for its treatment, which will be successful, when there is anything like power in the constitution.

I would, moreover, advise him to pass over the five or six pages which follow, as they will necessarily contain technicalities into which he can scarcely be expected to enter.

To my professional readers, on the contrary, I can only express the wish, that these observations may result in a more extended attention to the physiology of the organs concerned in this complicated disease.

For many years I had been accustomed to consider the views of Dr. Prout on the pathology of diabetes as correct, with reference to the stomach and primæ viæ, and that the change of amylaceous matters into sugar takes place in that part of the system; and notwithstanding the recent researches which give the glueogenic function to the liver, I am disposed to believe, that in many cases the gastric juice may be so changed as to resemble the

saliva in its properties, and that sugar may be absorbed independently of the liver.¹

This feeling may be the result of preconceived opinions; but it has agreed so well with my own sensations and reasonings, that I confess myself scarcely able to give it up; and think that we must be cautious, lest the striking discoveries of M. Bernard should induce us to refer the formation of sugar solely, and in all cases, to the liver.

Notwithstanding what has just been observed, I fully admit the importance of the recent researches into the properties of the liver, and so much so, that one great object I have in view, is to bring them prominently before the minds of my readers.

Had I written these remarks more imme-

¹ The recent experiments of M. Brown-Séquard (*Journal de la Physiologie de l'Homme et des Animaux*, pp. 158, 159) go to show that in the normal state starch is to a certain extent converted into sugar in the stomach; this power may be greatly increased in the diabetic, and thus be the reverse of that which we observe in some forms of dyspepsia, in which everything capable of such a change becomes intensely acid. It may also be noticed that the pancreatic juice, according to M. Bernard, has the power of converting starch into sugar.

diately after the publication of M. Bernard's lectures, it would have been necessary to give an account of his discoveries and opinions, but they have now been so long before the profession, that it would seem superfluous to do so, and I shall, therefore, at once pass on to the more recent experiments of our countryman, Dr. Pavy, who has now been some time devoting himself to the prosecution of these important researches.

It will be seen that they are a continuation of the experiments of Bernard, and that, although in some points they differ, this does not arise from any actual misrepresentation on the part of that distinguished observer, but from the peculiar nature of the experiments themselves, in which a slight deviation of temperature, or a short delay in their performance, occasions considerable, and in some cases important, differences in the results.

Without further preface, then, I shall proceed to give a brief summary of the conclusions at which Dr. Pavy has arrived, and this as nearly as possible in his own words. The full account of the experiments themselves is in the possession of the Royal Society, and will, I doubt not, be published *in extenso*.

They are then, briefly, as follows :

The liver, during life, produces no sugar, but only the substance named by Bernard glucogen, but which Dr. Pavy prefers to call hepatine, as it is only under peculiar circumstances in the living subject, and after death, that it becomes sugar.

In the normal state, during life, no sugar, or the merest trace (say $\cdot 017$ per cent.), is to be found in the blood of the right side of the heart—not even in dogs fed on vegetable diet.

The sugar found in the liver and blood of animals after death, is a *post-mortem* change of the hepatine.

In dogs fed on vegetables only, the liver undergoes great changes, the most remarkable of which are its increase to double the size, and its producing double the quantity of hepatine.

In dogs fed on tripe, with a mixture of sugar ($\frac{1}{4}$ lb. per diem), the liver becomes nearly as much enlarged as under the purely vegetable diet.

The size of liver compared with weight of animal kept on—

Animal diet	.	as 1 to 30,
Vegetable diet	.	„ 1 to 15,
Tripe and sugar	.	„ 1 to $16\frac{1}{2}$.

The cane sugar administered appeared as grape sugar in the urine.

Hepatine is not naturally formed for the purpose of transformation into sugar.

Hepatine possibly exists, during life, in a state of combination, which enables it to resist transformation into sugar.

It is probable, that an altered quality of the blood can produce the change by which hepatine passes into sugar. Thus, phosphoric acid injected into the jugular vein produces sugar, by destroying the alkalinity of the blood.

The saliva, blood, and tissue of liver transform hepatine into sugar most readily—contact with saliva at 100 almost instantaneously. If either an acid, alkali, or carbonated alkali be added, the change is most materially interfered with.

The post-mortem change into sugar is interrupted by cold, amongst other causes. For instance, a portion of liver thrown into a freezing mixture immediately after death showed no reaction, whilst another portion of the same liver not acted upon by cold gave a strong reaction.

Dr. Pavy believes that the hepatine goes to

the formation of fat, but further experiments are necessary to confirm this opinion; that it does not enter the blood as hepatine may be inferred from the fact, that when that substance is mixed with the blood it immediately becomes sugar.

Thus, when a portion of hepatine has been injected into the jugular vein, in an hour or less, sugar passes off largely by the kidneys.

Although, in the normal state, scarcely an appreciable amount of sugar is found in the system, it may be produced artificially during life, by either congestion or exhaustion; in the one instance, probably, from the hepatine being pressed out of the cells by the engorgement, in the other by the drain, as it were, sucking it out; and wherever hepatine is brought in contact with the blood, sugar will be formed.

When one part of the liver of an animal just killed is impregnated with potass, no sugar is formed in the part thus acted upon, whilst the hepatine in the other part is changed into sugar in the usual way. (This experiment must be performed before the post-mortem change has had time to take place; the animal is

pithed, the abdomen instantly opened, and the potass thrown into the portal vein.)

This experiment is now being pursued with acids; there are difficulties in the way of ascertaining the precise effect of the mineral acids, but the citric acid has been found to have the same effect as the potass, in preventing the change.

Dr. Pavy believes, with Bernard, that in the normal state sugar taken into the stomach is not absorbed by the lacteals, but passes into the portal circulation; in the liver it will appear to become hepatic, and to undergo some other change before it enters into the system.

The views formerly entertained (and in which Dr. Pavy concurred) as to an extensive destruction of the saccharine principle specially taking place during the passage of the blood through the lungs, are now shown to be erroneous.

This opinion arose from the supposition, founded on the examination of the blood after death, that sugar largely existed in the contents of the right side of the heart, whilst observation showed that the contents of the arterial system

were destitute, or nearly destitute, of a saccharine impregnation. The real condition of the right ventricular blood during life not being represented by its removal and examination after death, accounts for the fallacious deductions formerly arrived at.

I have thus far given an outline of some of the conclusions at which Dr. Pavy has arrived. Those who have leisure and inclination to go fully into the subject, will compare them with Bernard's 'Facts and Corollaries,'¹ and his subsequent lectures and papers. There can be little question but that these researches, together with those which are still being pursued, will ultimately lead to clear views of the pathology of diabetes. At present, it must be admitted that there are links wanting in the chain by which physiology is to be brought to bear on the subject, so as to give us a perfect theory. Moreover, we must not be led to neglect the observation of other facts which relate to that pathology, besides the glucogenic function of the liver.

Resuming my own remarks, I would repeat the opinion already expressed, that the nervous

¹ 'Leçons de Physiologie,' 1855, p. 474, et seq.

system is always more or less in fault in the diabetic state, whether we consider it as owing to a general failure of nervous power, combined with some peculiarity in the constitution which localizes it, and thus induces that particular manifestation, or as, in many instances, the effect of that failure, combined with some special reflex action. We are constantly in the habit of witnessing the effects of diminished or depraved nervous action, in the production of other diseases, modified, as they may be, by the constitution of the patient, or the peculiar circumstances in which he is placed.

Bearing this in mind, it is desirable that we should trace the various influences of the stomach, liver, skin, and kidneys on the nervous system, and on each other, in its production and perpetuation. In many patients the urine undergoes a change before it becomes decidedly diabetic—at least, we may infer this from their history—and probably the disposition, if then ascertained, might have been arrested. On the other hand, when not suspected, it only waits the concurrence of circumstances still further lowering the nervous

energy, and encouraging the setting up of diseased actions, to establish the complaint. These circumstances may vary, but will generally be found to consist of too amylaceous a diet, the influence of cold and damp, and these concurring (as in my own case) with too much strain upon the bodily and mental powers.

Dr. Prout remarks that animals are not subject to diabetes, and asks, "Can the exception be referred to that fertile cause of bodily disorder in human beings, the influence of mind?"¹

When there is any diabetic disposition in the system, it will be greatly encouraged by too large a proportion of amylaceous food. I have mentioned that in my own case, having been dyspeptic and bilious, rice, &c., had been directed for me, and that I had seen a gentleman who said he had been "a great bread-eater;" since then another patient, without any leading question from me, has used precisely the same expression.

¹ M. Bernard also mentions this fact, and almost omits it, as the physiologist has in consequence no means of vivisection.

The effects of cold and damp in favouring the development of the disease are too obvious to need being dwelt upon. I have often observed ordinary dyspepsia to become much more frequent and severe when the chills of autumn come on; and it seems to me, that the cold of November, and the action of east winds, produce peculiar effects on the diabetic, beyond their debilitating influence.

I am of opinion that mere cold or checked perspiration will not suffice to bring on the complaint in the first instance, but will strongly dispose to perpetuate it, or occasion a relapse.

Though the kidneys cannot of themselves produce sugar in the urine, they may add to the mischief by their habitually increased action, and will naturally do so, if the skin is allowed to become torpid and sluggish—the bad effects of this state of things on the general system are too obvious to need comment.

We must, moreover, not lose sight of the fact, that diabetes shortly becomes more or less a blood disease—the depraved digestion and assimilation must speedily alter its qualities, as well as impoverish and take away its powers of restoring the wasting fabric, and will have a still more direct

effect, if we take Dr. Pavy's view, that deteriorated blood can change hepatic into sugar in the living subject.

Besides the complications and varieties in diabetes already alluded to, there are, in the young, the dispositions to pulmonary disease, which are aggravated or induced by it, and in the advanced in life its combinations with dyspepsia, and its affinities with gout and calculus, all requiring a careful consideration.

The cases in which saccharine urine exists temporarily in other affections, such as those of whooping-cough, &c., recorded by Dr. Johnston ('Lanet,' p. 303, 1858), may eventually assist in throwing light on real diabetes.

A medical friend lately communicated to me some particulars of the case of a lady, who had been suffering several months from pulmonary disease, and was in a hopeless state when my friend first saw her; he detected the presence of diabetes from her breath, and found on examination that the amount of sugar was very great—the urine having been normal in quantity, and no thirst having existed, the diabetic affection had escaped notice. Future observations on cases like this, particularly in their earlier

stages, may assist our investigations.¹ In them there is, no doubt, a highly depraved state of the blood, and the organization of the lungs is destroyed in a way which differs from common tubercle, being a thorough disintegration of the substance.

That the brain and nervous system are primarily affected in diabetes, may also be inferred from cases where the disease has been occasioned by injury to the head or spine—one of this kind was lately under the care of Mr. Eriehsen, in the University College Hospital. A man fell from a haystack—diabetes and severe paralysis supervened, but he ultimately recovered.² The disease thus induced is, however, somewhat different from ordinary diabetes, and requires a modified treatment; it also, I believe, generally terminates more speedily

¹ This appears to me to have been rather an unusual case. It is not uncommon for old persons to have the urine saccharine, without being increased in quantity; but in the young this generally goes on to complete diabetes, having the increase in quantity as well as the sugar.

² See also a case published by Dr. Goolden, 'Lancet,' p. 656, 1854; and others are recorded.

and completely, and this may be expected, from there being no previous affection of stomach or liver.

The fact of saccharine urine being produced in animals by irritation of the fourth ventricle, leads us to suppose that the medulla oblongata is the part of the brain the functions of which are chiefly disturbed in diabetes.

It is, I believe, a generally received opinion, that the lower part of the brain is most concerned in supplying energy to the generative system; if this opinion is correct, may we not connect the two facts, viz., the diabetic disposition, and the deranged state of generative organs, which so commonly takes place in the progress of diabetes, as indicating that the neighbouring portions of that part of the brain which was first affected, become implicated?¹

It would seem that in cases of diuresis or diabetes insipidus, the deranged condition of the nervous system acts on the kidneys, without

¹ Since writing the above, I have seen similar remarks made by M. Bernard, who also goes into other particulars, on which I am not disposed to enter, but with respect to which, his observations entirely coincide with my own.

materially influencing the liver or stomach—thus, in hysteric diuresis, the kidneys undergo great excitement, more or less continued, which in most instances yields readily to medicines calculated to quiet the nervous system.

I had often occasion to witness the effects of even slight nervous excitement, in a gentleman who suffered during a pretty long life from diuresis, and who ultimately sank from paralysis and brain disease—such cases are not uncommon.

I have at this time under my care an infant who has had two attacks of diuresis—there is some peculiar debility in the system which occasions the teething process to be suspended, and also gives rise to the diuresis—each attack has been checked almost immediately, by small doses of the *Tinet. Ferr. Sesquieh.*

Diabetes insipidus seems to be owing to an affection of a different but adjoining portion of the brain to that which is affected in diabetes mellitus.

In Bernard's experiments on the fourth ventricle, if the exact spot of the brain is not touched, diuresis, and not saccharine urine, is the consequence, or both may be produced at the

same time by a somewhat different application of the instrument.

Dr. Gull is of opinion that there are two kinds of diabetes insipidus, besides the hysteric form. One, which ought rather to be termed polydipsia, and is probably owing to irritation of the pneumo-gastrie nerves, producing intense thirst—the amount of fluid taken of course occasions a corresponding increase in the quantity of urine. In the other, thirst is not so prominent a symptom, and there is a little mucus in the urine, indicating that, from whatever cause the disease may arise, the kidneys are more or less in fault.

The material termed hepatine, whether it goes to the formation of fat or not, is, without doubt, essential to the well being of the system; and the discovery that it can be formed by the liver from animal substances is important, as tending to remove the apprehension felt by Dr. Prout and others, that the system would suffer by abstinence from amylaceous food, a fear which has often influenced their practice.

Independently of that discovery, this fear need not, I think, be seriously entertained, as long as the appetite continues, if we consider

the habits of those races who subsist entirely on animal food, and are notwithstanding vigorous and active. The wild Indian is without the Cerealia, and the natives of South America in the Argentine provinces, although of Spanish descent, live without vegetables of any kind.

A friend long resident at Buenos Ayres, who had estates up the country, writing to me, says, "The diet of the South Americans, who are engaged with the herds of cattle, consists entirely of flesh, to the exclusion of grain or vegetable productions containing starch; they consume a large quantity of fat.

"Many of the largest cattle-farms produce only grass, rarely cultivating a foot of ground for any purpose.

"The Indian tribes in the province of Buenos Ayres subsist entirely on flesh, principally that of mares, which they prefer. Both the natives of Spanish descent, and the Indian tribes, are, generally, healthy and hardy races, not being subject to any particular disease arising from the use of animal food." ¹

This account is also confirmed by Mr. M'Cann, author of 'Two Thousand Miles' Ride through

¹ MS. letter from Samuel Bishop, Esq.

the Argentine Provinces,' who, speaking of the same people, says (p. 24, vol. i) "they have neither bread, milk, nor vegetables, and seldom eat salt;"¹ probably the fat consumed by these races, as well as the Esquimaux and tribes in the Arctic regions, supplies to the system what is furnished in Europe by the Cerealia. In the Arctic regions fat is a necessary of life.

Quitting these general observations, we may proceed with our practical considerations, and repeat that, whatever theories we may entertain, there is nothing to prevent our treatment from being simple and decisive.

We must, in our plan of diet, deny all those

¹ See also p. 157, vol. i, where the same author describes his visit to a rich man, who (to use his own expression) "lived in a natural state"—spurs, stirrups, &c., of *silver* hung round the walls—"our food consisted of beef, and beef only, without either salt, bread, biseuit, or vegetable of any sort; water was our drink."

The flesh being in a recent state, and roasted (sometimes with part of the skin on), the animal juices are more retained, and this is probably the reason why salt is not so necessary, the saline portions being transferred with the rest of the nourishment from the animal to the man.

articles of food which favour the morbid actions, at the same time that we nourish the patient as much as possible, give tonics to invigorate the nervous system, and to assist in renovating the blood; and these tonics must have reference to the organs most implicated, as far as they can be ascertained. Where, as in many elderly persons, the disease seems to be a modification of dyspepsia, our remedies should be adapted accordingly, and will chiefly consist of alkalies and bitters, with or without iron.¹

In younger subjects, the mineral acids, especially the nitric and hydrochloric, or their combination, or the latter with iron, as in the T. Ferr. Sesquich., will be useful, whether they may be considered as general tonics, or as acting specifically on the liver and the blood. I repeat, however, that each case, whether of young or old, has its peculiar modifications, and requires to be made a separate study; and this will cease to be a subject of surprise, if we recollect that, besides the varieties of indi-

¹ The Mist. Ferri Compos. was the favorite medicine of the late Dr. Latham, who seems to have been more successful than many of his successors. (See 'Observations on Diabetes,' 1811.)

vidual constitution, there are several organs concerned in the disordered actions.¹

It is stated in my paper, that when I began the bran cake, my condition was such as to determine me to abstain from all amylaceous food, together with every solid and liquid containing sugar, or any substance readily convertible into it, and to do this at any risk.

Inconveniences were expected to arise, which never occurred when the proper mode of preparing the bran was hit upon, and I have not observed any ill consequences in others from this abstinence; in cases where the ordinary forms of dyspepsia coexist with diabetes, the diet, although conducted on the same general principles, requires to be watched over, and varied, and the medical treatment to be more studied.

With regard to change of air, which I consider to be essential in the cases of young people, it is by no means so necessary in those resembling my own (although it assists them also, if a proper regimen be persevered in). I had an instance of this a little time since, in a patient who had long been wandering about in search of

¹ This remark is fully borne out by Dr. Prout. (See his 'Treatise,' p. 56, 3d edition.)

health, and yet losing ground, but who began to rally as soon as he was put upon a proper plan of diet and medicine, and, without again leaving home, resumed his former occupations.

However paradoxical it may appear, I believe that my life has been prolonged by the attack of diabetes—previously I was dyspeptic and bilious, and had symptoms which, there is no doubt in my own mind, would have proceeded to fatty degeneration of the heart—the meat diet first, and then its combination with the bran cake, altered this state of things, and I have now firm muscles, and am a stranger to the feeling of want of power in the circulation.

Since that time, I have been more anxious to direct patients, at all disposed to obesity, with a feeble circulation, to take animal food (with fruit and vegetables), rather than bread, rice, and potatoes.

It is, indeed, my opinion, that the energies of the brain itself, and its normal condition, as to the molecules of which it is composed, may be better preserved in some cases (not exclusively those of diabetes) by animal diet, provided that other causes of congestion are avoided.

When the use of bran was first suggested, it

was merely to enable me to dispense with bread, and not as a nutrient; but it has long appeared to me that this was an imperfect view of its utility, and all late writers on the subject confirm that opinion.

Dr. Marcet, in his work on Food, &c., p. 14, says, "From the large quantity of gluten known to exist in bran, it may be concluded that, in the present system of grinding, the most nutritious part of the grain is not included in the flour." Dr. Hassall's remarks, p. 258, &c., in his work on Food, &c., are to the same effect. Every analysis of bran gives a large proportion, not only of gluten and fatty matter, but of mineral salts, which latter are contained in the bran, and not in the farina, and which I think likely to supply the blood with those minute, but yet important substances, which tend materially to constitute the difference between healthy vigorous blood, and the contrary.¹ Notwithstanding what is above said by myself and others, the popular predilection for white bread

¹ Professor Johnstone's analysis, quoted by Dr. Marcet, gives 7·3 per cent. of saline matter in bran; and this proportion will be much increased in bran prepared for the cake.

is well founded, if not carried too far, as when the bran is left in the bread, it becomes less nutrient, from being hurried through the bowels, the bran itself is too large to be fully digested, and thus there is a double loss.¹ The case is quite altered when the bran is reduced to a very fine powder; in that state it retains all its valuable constituents, mixes with the animal food, and has every chance of being properly digested.

I consider it a great mistake to suppose that brown bread will suffice for diabetics, instead of the bran cake—brown bread, whether made of unbolted meal, or bran added to the white dough (as is done by the majority of the London bakers), is yet chiefly composed of starch thus disguised.

¹ Mr. Stevens, of Patriot Row, whose bread was exhibited some time since at the Polytechnic Institution, informs me, that his West End customers take about equal parts of brown and white bread; whilst the poor in his neighbourhood have a very small portion of brown, and seldom any, if they can get white. Both parties are right: to the rich, bread is much less the staple article of diet, and the aperient property of the bran beneficial; the case is opposite with the poor, to whom, with their children, bread is the staff of life.

The bran itself, when alone and unwashed, contains 52 per cent. of starch, according to the analysis of Miller.

It is the opinion of some (and Dr. Hassall appears to concur in that opinion) that the bran promotes a peculiar kind of fermentation, and thus renders the panification more complete—however this may be, I have been more frequently sensible of a sweet taste after brown bread than white.

I have little to add to what is said in the former paper respecting animal food—only to notice that it is desirable to vary the food during the same day, taking the lighter kinds in the later meals.

I have never restricted others in the use of eggs, or the fat of meat, although obliged to refrain from both in a great measure at one period of my illness.

Being of opinion that fat assists materially in supplying the want of the Cerealia, I am disposed to recommend it, and the more so, having taken it freely myself now for some years without any discomfort. Dr. Prout recommends butter, in which I fully concur. Eggs, where they agree, are very proper, and form a most important article in the diabetic bill of fare.

Soups may be allowed, but they should be really good, and flavoured with aromatics or onions, to the exclusion of earrots, turnips, and peas. The bran cake may be eaten at the same time, but not put into the liquor.

In the state to which I was once reduced, previously to the use of the bran cake, much benefit was experienced from a cup of beef tea, very early, sometimes at 4 or 5 in the morning. When further recovered, a cup of warm milk, with a little nutmeg, at 7, was substituted.

As to vegetables, besides those mentioned in the paper may be added onions, and, in most cases, turnips—parsnips and earrots have been advised, but I cannot join in the recommendation.

I have found lettuees to agree well, eaten sparingly with oil and vinegar, and see no objection to their use in cases in which they do not produce flatulency or discomfort. Pickles, in small quantities, may be permitted to convalescents, who have no dyspeptic tendency sufficient to forbid them.

Besides allowing the patient his choice of coffee or tea, he may have cocoa, prepared from the nibs, not that sold in cakes, or powder,

which contains a great portion of sugar and the low starches.

With regard to wines, chemically considered, we should allow claret, and I mentioned it before with approval, but cases have since occurred which make me hesitate. In some, the combination of gout with diabetes, and in others, a disposition to the formation of lithic acid, has induced me to forbid it. As a corrective to any injury which might arise from claret, Vichy water has been recommended to be taken with it, and this may be an excellent beverage; my objection is, that it encourages the patient to drink, the tendency to which should rather be repressed.¹

During my short visits to Belgium and France, I made trial of the wines, which certainly did me much injury; and I am disposed to believe that the frequency of

¹ I am glad to find in the recent publications on diabetes, that attention is being paid to abstinence from liquids, as a remedial means.

During my extremity great relief was afforded by carrying with me a small phial of milk and lime-water (equal parts), a sip relieved the thirst without adding to the disease.

diabetes in the latter country, may be partly attributable to the poor acid wines which are the general beverage.

To some patients, sound malt liquor may be directed with advantage, but it must be in its best state, and its effects carefully watched. Convalescents may have a little very dry sherry, or old port, but the fruity wines, now in general use, should be entirely interdicted, and, I repeat, that of all the alcoholic beverages, weak brandy-and-water is the safest, the quantity of brandy being directed by the medical attendant, and always *measured*.

Fruits are permitted by some practitioners, but in this indulgence I cannot bring myself to concur, and when the complaint is under control, the desire for them is so diminished, that the privation will be of comparatively little importance.

With regard to fruits in general, I know that the experience of physicians, for whose judgment I entertain a high opinion, coincides with my own, as some of them have so far interested themselves in my welfare, as to caution me against any return to their use.¹

¹ I have already mentioned the ill effects of eating

Having seen cases where previous medical advisers had allowed a degree of indulgence in fruit, I am disposed to think, that the profession generally have lately not been sufficiently strict in this respect. A gentleman consulted me some months since, who had taken grapes frequently. It is true, that his diet, whether as directed or not, had not been well managed in other respects. He was losing strength, and fast failing, when I first saw him; had tried the bran cake, at the recommendation of some friend, for a week or two, and discontinued it on account of relaxed bowels. Not being certain how this gentleman's cake had been prepared, I had some made for him in my own house, and gave him the citrate of ammonia, with a small dose of Tinet. Camph. Compos., and three or four grains of Dover's powder at night. He soon improved, and was able to take the bran cake (as prepared by Mr. Blatchley), without any opiate, or the bowels being affected. A few weeks restored him to comfort, and he

apples in my own case, and have lately heard of another, in which I believe they hastened the fatal termination.

See also a remarkable case mentioned by Dr. Latham, and Dr. Prout's observations on this point.

has since been capable of laborious exertion of body and mind, although upwards of seventy.¹

Sugar has lately been recommended, both here and in France; of this I have no practical experience.

It may not be generally known, that the saccharine plan was freely tried, some sixteen or seventeen years ago, at Guy's Hospital, by Dr. Bright, at the suggestion of Dr. Gull, and laid aside again, having been followed by no useful results. The patients were allowed 1 lb. of brown sugar per diem, and the first day or two, thought themselves better. After a while, no improvement taking place, it was suggested that grape sugar ought to have been given instead of cane. Dr. Taylor having been applied to, as to the best way of obtaining it, recommended to take old honey, which had become partially crystallized, and wash away the more liquid portions—the residue is grape sugar. This was freely administered, but with no better success, and, after a time, the plan was altogether abandoned.

Dr. Garrod has also tried the saccharine

¹ I prescribed opiates for this gentleman, but they were in very small doses, and soon laid aside.

plan in the University College Hospital—he found that a patient could bear sugar, without being injured by it, only at those times when he could equally well bear amylaceous food.¹

Before elosing these remarks, I wish to observe that persistence in the diabetic diet recommended here, and in my former paper, will render it quite agreeable, in a great majority of cases, and when difficulties occur, they may be overcome by a little management, and medical direction—at least this has been my

¹ Since the above was written, Dr. Bence Jones has published a paper on the subject in the ‘Medical Times,’ for May 1st, 1858, which has drawn forth a reply from Dr. Budd in the same journal for May 22d; there has also been a paper by Dr. Sloane in the ‘British Medical Journal,’ for May 29th, detailing experiments on several cases.

On this subject I have no experience of my own to offer, and fear that it would now be difficult to obtain exact notes of the cases treated in Guy’s Hospital before referred to.

Further time must elapse, and more extended observations be made, before I could bring myself to prescribe sugar for a diabetic; yet I can conceive that there may be cases, in which actual sugar would be less injurious than the amylaceous matters which the depraved actions turn into sugar.

experience in the cases which have come under my own observation.

For myself, (when in health,) I prefer the bran cake, at breakfast, dinner, and supper, to the finest bread, and a mere taste of sugar is highly disagreeable.

To convalescents, I allow a little wheat,¹ variously prepared, but only to convalescents, and for this indulgence am unable to lay down any precise rule; whatever is permitted by the medical attendant must be clearly defined, and never exceeded. Dr. Prout repeats the observation, that it is easier to abstain, than to refrain, and I would also join in the cautions he gives respecting, *a little*, a term which may be so variously interpreted by the patient. Wheat is almost the only amylaceous matter allowable.

I am the more desirous to make these remarks, as to the non-unpleasantness, (if I

¹ My own allowance is about two ounces per diem, and not in the form of bread. "Tout le monde sait que l'amidon se transforme en glucose pendant la panification," says M. Brown-Séquard. I quite agree with him as to the fact, but am not so sure that everybody is aware of it.

may use such a term,) of the diabetic diet, from having seen it described, in some recent publications, as insupportable, and not likely to be persevered in. Privations have to be endured, it is true, but they are as nothing compared with the comfort and support which are soon felt to result from really sustaining food.

With the varieties of animal food, and fish of all kinds—eggs—the bran cake—milk—greens, and some other vegetables, there is little cause for complaint; many persons voluntarily pursue a much more rigid course of diet.

In conclusion, it may be observed that no diabetic need expect to recover or continue well, who cannot exercise self-control, and make up his mind to be temperate, *in all things*.

I have thus far fulfilled the intention with which I set out, having given the sequel of my history and experience, since the publication of my paper in the ‘Transactions of the Royal Medical and Chirurgical Society;’ and a brief account of the recent physiological inquiries which relate to this subject.

I had hoped that the full detail of Dr. Pavy’s experiments would ere now have been before

the public, but in this am disappointed; he has, however, at my request, examined my account of them in MS., and thus an accurate transcript of his opinions has been secured.

For myself, I do not elaim the honours due to men who are able to devote their time and talents to the labours of the dissecting-room or the laboratory. Mine has been a more practical task;—that of observing the effects of diet *& Medicine* on myself, and those who have been under my care, and reporting my observations with simplicity and truthfulness. After fourteen years of health and comfort already added to my life, and having been the means of reseuing others of my fellow-sufferers, I have felt it at once my duty and my privilege, to disseminate as widely as possible the results of my experience in the treatment of diabetes.

A P P E N D I X.

Formula for Bran Cakes.—Take a sufficient quantity (say a quart) of wheat bran, boil it in two successive waters for a quarter of an hour, each time straining it through a sieve, then wash it well with cold water (on the sieve), until the water runs off perfectly clear; squeeze the bran in a cloth as dry as you can, then spread it thinly on a dish, and place it in a slow oven; if put in at night let it remain until the morning, when, if perfectly dry and crisp, it will be fit for grinding. The bran thus prepared must be ground in a fine mill and sifted through a wire sieve of such fineness as to require the use of a brush to pass it through; if grinding once is not sufficient, it must be ground again until quite soft and fine. Take of this bran powder 3 oz. three new-laid eggs, $1\frac{1}{2}$ (or 2 oz. if desired) of butter, and rather more than half a pint of milk, mix the eggs with a little of the milk, and warm the butter with the other portion; then stir the whole well together, adding a little nutmeg and

ginger, or any other agreeable spice. Bake in small tins (pattipans), which must be well buttered, in a rather quick oven for about half an hour. The cakes, when baked, should be as thick or a little thicker than a captain's biseuit; they may be eaten with meat or cheese for breakfast, dinner, and supper; at tea they require rather a free allowance of butter, or may be eaten with *curds* or any of the soft cheeses.

In the 'Medieal Gazette,' May 2d, 1857, was published what I considered an improved form, which resembled the above in its composition, only that I directed, first, 35 grs. of sesquicarbonate of soda, and then 3 drachms of dilute hydrochloric acid, to be stirred into the mass immediately before baking, and that it should be baked in a bason as one loaf or cake.

This amended form, as it was termed, is very agreeable, but requires more management, and does not keep so well; consequently, I now generally recommend the old formula.

I cannot be too particular in directing that the bran should be reduced to a very fine powder, and, in order to this, as well as to deprive it of its starch, it should be *well* washed and dried; by this means it is rendered friable, and the process shortened—that which remains

after the first sifting, should be ground again and again, until it becomes fine.

Mr. White, of Holborn, who made my mill, and was subsequently employed by others, attempted to grind the bran for them, and failed for some time, from not washing and drying the bran, which, in its common state, is soft, and not easily reducible to fine powder. In some seasons of the year, or if the cake has not been well prepared, it changes more speedily than is convenient—this may be prevented by placing the cake before the fire for five or ten minutes every day, and it is best to do so at all seasons of the year.

Mr. Blatchley, of 362, Oxford Street Near the Pantheon, makes the bran cake, and prepares the powder for those at a distance, who have no mill, or wish to avoid the trouble.

Mr. Smith, baker, of Gower Street North, prepares bran biscuits for several of the hospitals, which have the advantage of keeping well. *90, 15 Brunswick St.*

Mr. ~~Archer~~, of 251 A, High Holborn, has succeeded Mr. White, the mill-maker. Small mills, for a single person's use, are not very expensive.





1871. March 1st

Re. journal of the life of
the Mother

In leaves - Cakes best
leaf too small. Difference
between the Cakes - 1/2
cups - 1/2 cup of sugar
10 days - For Cakes just
4 oz of the mixture in
Cakes.

There is of meat for over
1/2 of a pound
Washing & drying

All should be washed &
dried, to be washed &
dried.

Not the same as with
L. & S. in mind,
The same should be
dry. What better

